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EXAMINER	
CUTLER, ALBERT H	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/701,829	COOPER, J. CARL	
	Examiner	**Art Unit**	
	ALBERT H. CUTLER	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) *15 and 16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 17-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/13/2007*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. This office action is responsive to communication filed on June 14, 2007. Claims 1-23 are pending in the application.

Response to Arguments

2. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

Election/Restrictions

3. Newly submitted claims 15 and 16 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The original claims relate to an imaging system using a charge coupled device array(see claim 4), and performing image manipulation through image rotation. However, the newly submitted claims 15 and 16 relate to an imaging system using an imaging device selected from a group consisting of vacuum tubes, vidicon tubes, or plumbicon tubes, and providing image manipulation through deflection of a scan beam. The two imaging systems described above are not connected in any of design, operation, or effect. Such imaging system found in claims 15 and 16 necessitates a search in a completely different area from that found in claim 4, and thus constitutes a separate invention.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 15 and 16 withdrawn from consideration

as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Information Disclosure Statement

4. The information disclosure statement filed December 13, 2007 was received. The U.S. patent references listed have been considered by the Examiner. No foreign documents or non-patent literature has been received by the Examiner. Thus, these documents have not been considered by the Examiner as indicated on the I.D.S.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-9, 13(1), 13(2) and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas(US 6,781,623) in view of Hinckley et al.(US 7,289,102).

Consider claim 1, Thomas teaches:

A digital imaging system(figures 5 and 6) comprising:

a. an image sensor("CCD", 16, figure 6, column 4, lines 38-41) and a separate display(12);

b. an image sensor orientation sensor("sensor", 20, figure 6, column 4, lines 42-45); and

c. at least one image manipulator("Digital Signal Processor", 36, figure 6, column 5 lines 18-24) adapted to:

i) receive image sensor orientation(See figure 6, the image sensor orientation is obtained by the frame memory(38), which is connected to the image sensor(16), and provided to the image manipulator(34), column 5, lines 15-22.);

ii) receive image orientation(See figure 6, the image orientation is obtained by the sensor(20) and provided to the image manipulator(34), column 5, lines 18-26.); and

iii) adjust the image orientation(The image manipulator(34) applies a rotational transform to the image, column 5, lines 18-26, figure 7, column 6, lines 33-46.)

However, Thomas does not explicitly teach the display being capable of rotating through at least one angle that is independent from the rotation of the image sensor, of a display orientation sensor, or of receiving the display orientation and adjusting the image orientation based on the display orientation.

Hinckley et al. are similar to Thomas in that Hinckley et al. teach of a portable device(figure 3) having a display(304) and an orientation sensor(308, column 4, lines 16-38). Hinckley et al. teach that the portable device receives image data from an

outside source(column 2, lines 31-37, column 2, line 61 through column 3, line 3, column 9, lines 24-33).

However, in addition to the teachings of Thomas, Hinckley et al. teach the display(304) being capable of rotating through at least one angle that is independent from the rotation of the image sensor(See figures 10 and 11, column 9, lines 24-33. There is no image sensor in the device taught by Hinckley et al. Hinckley et al. simply receives image information from external sources.), of a display orientation sensor(304, column 3, lines 25-34, column 4, line 30 through column 5, line 3), and of receiving the display orientation and adjusting the image orientation based on the display orientation(Column 9, line 18 through column 10, line 62).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include an independent display in which the display orientation is sensed and corrected as taught by Hinckley et al. in the digital camera system taught by Thomas for the benefit of expanding the functionality of the digital camera system without requiring the user to perform any additional actions(Hinckley et al., column 1, lines 40-45).

Consider claim 3, and as applied to claim 1 above, Thomas further teaches that the digital imaging system is chosen from the group consisting of still cameras and video cameras(The digital imaging system could be either a still camera of video camera, column 5, lines 27-45).

Consider claim 4, and as applied to claim 1 above, Thomas further teaches that the image sensor("CCD", 16, figure 6) is a charge couple device array(column 4, lines 38-41).

Consider claim 5, and as applied to claim 1 above, Thomas further teaches that the image sensor orientation sensor is chosen from the group consisting of mechanical gyroscope sensors(Thomas teaches that a mechanical gyroscope sensor can be used to apply a rotational transform and maintain an orientation which has been manually aligned, column 7, line 35 through column 8, line 19.)

Consider claim 6, and as applied to claim 1 above, Thomas further teaches that the image manipulator comprises an image rotation system(The image manipulator(34) applies a rotational transform to the image, column 5, lines 18-26, figure 7, column 6, lines 33-46. One way to apply a rotational transform is through baseline orientation coordinates, column 5, line 62 through column 6, line 5.).

Consider claim 13, and as applied to claim 1 above, Thomas teaches of using a mechanical gyroscope orientation sensor capable of sensing rotations in two dimensions(See column 8, lines 4-19. A mechanical gyroscope can be used to correct the alignment of the video camera. The alignment is corrected in two dimensions, column 4, lines 42-62, figures 2-4).

Consider claim 2, Thomas teaches:

A digital imaging system(figures 5 and 6) comprising:

a. an image sensor configured to sense an image subject and to capture a presentation of the image("CCD", 16, figure 6, column 4, lines 38-41); and a separate display device(12) configured to display said presentation of said image(column 4, lines 17-62, column 7, lines 61-67);

b. an image sensor orientation sensor("sensor", 20, figure 6, column 4, lines 42-45) configured to sense changes in the orientation of an image with respect to a first image sensor base line orientation coordinates("The sensor(20) is operable to determine the orientation of the hand-held terminal relative to its environment. More specifically the sensor is configured to determine a rotational angle between the vertical alignment axis(i.e. changed orientation axis) of the hand-held device and a reference alignment axis(i.e. base line orientation coordinates) defined by a real space orientation." Column 4, lines 42-48); and

c. at least one image manipulator("Digital Signal Processor", 36, figure 6, column 5 lines 18-24) adapted to:

i) receive image sensor orientation from the image sensor orientation sensor(See figure 6, the image sensor orientation is obtained by the frame memory(38), which is connected to the image sensor(16), and provided to the image manipulator(34), column 5, lines 15-22.); and

iii) adjust the image orientation in relation to the first baseline orientation coordinates(The image manipulator(34) applies a rotational transform to the image,

column 5, lines 18-26, figure 7, column 6, lines 33-46. One way to apply a rotational transform is through baseline orientation coordinates, column 5, line 62 through column 6, line 5.)

However, Thomas does not explicitly teach the display being capable of rotating through at least one angle that is independent from the rotation of the image sensor, of a display orientation sensor configured to sense changes in the orientation of said display device with respect to a second display device base line coordinates, or of receiving the display orientation and adjusting the image orientation based on the display orientation.

Hinckley et al. are similar to Thomas in that Hinckley et al. teach of a portable device(figure 3) having a display(304) and an orientation sensor(308, column 4, lines 16-38). Hinckley et al. teach that the portable device receives image data from an outside source(column 2, lines 31-37, column 2, line 61 through column 3, line 3, column 9, lines 24-33).

However, in addition to the teachings of Thomas, Hinckley et al. teach the display(304) being capable of rotating through at least one angle that is independent from the rotation of the image sensor(See figures 10 and 11, column 9, lines 24-33. There is no image sensor in the device taught by Hinckley et al. Hinckley et al. simply receives image information from external sources.), of a display orientation sensor(304, column 3, lines 25-34, column 4, line 30 through column 5, line 3) configured to sense changes in the orientation of said display device with respect to a second display device base line coordinates(column 9, lines 34-47), and of receiving the display orientation

and adjusting the image orientation based on the display orientation(Column 9, line 18 through column 10, line 62).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include an independent display in which the display orientation is additionally sensed and corrected as taught by Hinckley et al. in the digital camera system taught by Thomas for the benefit of expanding the functionality of the digital camera system without requiring the user to perform any additional actions(Hinckley et al., column 1, lines 40-45).

Consider claim 13, and as applied to claim 2 above, Thomas teaches of using a mechanical gyroscope orientation sensor capable of sensing rotations in two dimensions(See column 8, lines 4-19. A mechanical gyroscope can be used to correct the alignment of the video camera. The alignment is corrected in two dimensions, column 4, lines 42-62, figures 2-4).

Consider claim 7, Thomas teaches:

A digital camera(figures 5 and 6) comprising:

a. a charge coupled device image sensor("CCD", 16, figure 6, is a charge couple device array, column 4, lines 38-41);

b. an orientation sensor that detects orientation of said charge coupled device image sensor relative to gravity(Thomas teaches of an orientation sensor(20) that may be a magneto-inductive sensor, column 4, line 63. However Thomas further teaches in

an alternate embodiment that a gyroscope can be used to sense the orientation of the camera, column 7, line 35 through column 8, line 19. The orientation can be relative to gravity, column 5, lines 4-9.); and

d. at least one image manipulator("Digital Signal Processor", 36, figure 6, column 5 lines 18-24) adapted to:

i) receive said charge coupled device image sensor orientation(See figure 6, the image sensor orientation is obtained by the frame memory(38), which is connected to the image sensor(16), and provided to the image manipulator(34), column 5, lines 15-22.);

iii) rotate the image produced by said charge coupled device image sensor to reconcile differences relative to gravity between said orientation of said charge coupled device and the image displayed(The image manipulator(34) applies a rotational transform to the image, column 5, lines 18-26, figure 7, column 6, lines 33-46.).

However, Thomas does not explicitly teach means to receive the orientation relative to gravity of a display device capable of displaying the image produced by said charge coupled device image sensor, or of receiving the display orientation and adjusting the image orientation based on the display orientation.

Hinckley et al. are similar to Thomas in that Hinckley et al. teach of a portable device(figure 3) having a display(304) and an orientation sensor(308, column 4, lines 16-38). Hinckley et al. teach that the portable device receives image data from an

outside source(column 2, lines 31-37, column 2, line 61 through column 3, line 3, column 9, lines 24-33).

However, in addition to the teachings of Thomas, Hinckley et al. teach of a display orientation sensor(304, column 3, lines 25-34, column 4, line 30 through column 5, line 3) configured to sense changes in the orientation of said display device with respect to gravity(column 4, lines 35-38, column 9, lines 34-47), and of receiving the display orientation and adjusting the image orientation based on the display orientation(Column 9, line 18 through column 10, line 62).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include a display in which the display orientation is additionally sensed and corrected as taught by Hinckley et al. in the digital camera taught by Thomas for the benefit of expanding the functionality of the digital camera system without requiring the user to perform any additional actions(Hinckley et al., column 1, lines 40-45).

Consider claim 8, and as applied to claim 7 above, Thomas further teaches that the digital camera is chosen from the group consisting of still cameras and video cameras(The digital imaging system could be either a still camera of video camera, column 5, lines 27-45).

Consider claim 9, and as applied to claim 7 above, Thomas further teaches that the gyroscope orientation sensor is chosen from the group consisting of mechanical

gyroscope sensors(Thomas teaches that a mechanical gyroscope sensor can be used to apply a rotational transform and maintain an orientation which has been manually aligned, column 7, line 35 through column 8, line 19.).

Consider claim 14, and as applied to claim 7 above, Thomas teaches of using a mechanical gyroscope orientation sensor capable of sensing rotations in two dimensions as the orientation sensor that detects the orientation of said charge coupled device(See column 8, lines 4-19. A mechanical gyroscope can be used to correct the alignment of the video camera. The alignment is corrected in two dimensions, column 4, lines 42-62, figures 2-4).

8. Claims 17, 19, 20, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hinckley et al.(US 7,289,102) in view of Thomas(US 6,781,623).

Consider claim 17, Hinckley et al. teach:

A display(304, figure 3) for an image produced by another device in a digital imaging system(See column 2, line 29 through column 3, line 3, column 9, lines 24-33. The display is for a mobile device which receives image data.), wherein said display is physically separate from said image sensor and is capable of rotating through at least one angle that is independent from the rotation of said image sensor(The mobile device taught by Hinckley et al. does not include an image sensor.);

said display(304) comprising:

a. a display orientation sensor(304, column 3, lines 25-34, column 4, line 30 through column 5, line 3);

c. an image manipulator adapted to receive display orientation and adjust the image orientation(Column 9, line 17 through column 10 ,line 58).

However, Hinckley et al. do not explicitly teach that an image sensor component produces the displayed image, or of means to receive the orientation of said image sensor.

Thomas is similar to Hinckley et al. in that Thomas teaches a device(figure 5) for transmitting and receiving image data(column 4, lines 15-41).

However, in addition to the teachings of Hinckley et al., Thomas teaches that an image sensor component(16, figure 6) produces the displayed image(column 4, lines 36-41, column 5, lines 13-55), and of means to receive the orientation of said image sensor("The sensor(20) is operable to determine the orientation of the hand-held terminal relative to its environment. More specifically the sensor is configured to determine a rotational angle between the vertical alignment axis(i.e. changed orientation axis) of the hand-held device and a reference alignment axis(i.e. base line orientation coordinates) defined by a real space orientation." Column 4, lines 42-48). Thomas teaches that images can be transmitted from the imaging device along with orientation information so that the receiving device can perform an image rotation right before display, column 7, lines 5-25.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have the image data received by Hinckley et al. comprise

image data obtained by an image sensor and transferred along with orientation information of the image sensor as taught by Thomas for the benefit of increasing the versatility of the display device taught by Hinckley and achieving maximum perceived picture quality of a displayed image(Thomas, column 2, lines 23-26).

Consider claim 19, and as applied to claim 17 above, Hinckley further teaches that the display is a mobile display(see figure 3, column 4, lines 16-17).

Consider claim 20, and as applied to claim 17 above, Hinckley further teaches that the image manipulator comprises an image rotation system(see column 9, lines 39-47).

Consider claim 22, and as applied to claim 17 above, Hinckley further teaches that the display orientation sensor can consist of an electronic gyroscope sensor(column 5, lines 2-3).

Consider claim 23, and as applied to claim 17 above, Hinckley further teaches that the display orientation sensor can consist of an electronic gyroscope sensor(column 5, lines 2-3). However, Hinckley does not explicitly teach that said gyroscope works in two or three dimensions.

Thomas teaches that a mechanical gyroscope orientation sensor capable of sensing rotations in two dimensions can be used as an orientation sensor(See column

8, lines 4-19. A mechanical gyroscope can be used to correct the alignment of the video camera. The alignment is corrected in two dimensions, column 4, lines 42-62, figures 2-4).

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas in view of Hinckley et al. as applied to claim 7 above, and further in view of Harrison(US 6,597,384).

Consider claim 10, and as applied to claim 7 above, Thomas does not explicitly teach detecting the orientation of a display.

Hinckley et al. teach of using touch sensors, but do not explicitly teach manually entering orientation information.

Harrison is similar Hinckley et al. in that Harrison teaches a mobile device(figures 1a and 1b) with a display and touch sensors(100, 102, 104, 106).

However, in addition to the teachings of Thomas and Hinckley et al., Harrison teaches that the touch sensors are used to manually enter the display orientation(figure 3).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to manually enter display orientation information as taught by Harrison in the digital camera taught by the combination of Thomas and Hinckley et al. for the benefit that the user can obtain the correct image orientation when the displayed image orientation is incorrect(Harrison, column 2, lines 38-39).

10. Claims 11(1), 11(2) and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas(US 6,781,623) in view of Hinckley et al.(US 7,289,102) as applied to claims 1, 2 and 7 above, and further in view of Ahisha(US 2005/0007477) and Riconda et al.(US 2002/013093).

Consider claim 11, and as applied to claim 1 above, Thomas teaches that the sensor provides two-dimensional information(column 4, lines 42-59).

Hinckley et al. teach that the orientation sensors produce three dimensional orientation information(column 4, line 30 through column 5, line 3), and that said orientation information is used to correct perspective distortions of the image being viewed(column 9, line 34 through column 10, line 36).

However, the combination of Thomas and Hinckley et al. does not explicitly teach using the three dimensional orientation information to correct for keystone, barrel and other distortions that result when the image sensor is located off of the perpendicular axis with respect to the plane of the image being sensed.

Ahisha is similar to Thomas in that Ahisha teaches of a camera containing an image sensor(30) and an image processor(40, figure 1).

However, in addition to the combined teachings of Thomas and Hinckley et al., Akisha teaches using coordinate information to correct for barrel and other(i.e. pincushion) distortions(see figure 2) that result when the image sensor is located off of

the perpendicular axis with respect to the plane of the image being sensed(See paragraphs 0021-0029, especially paragraphs 0024, and 0026-0029).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the coordinate information taught by the combination of Thomas and Hinckley et al. to correct for barrel and pincushion distortion as taught by Akisha for the benefit of improving perceived image quality.

The combination of Thomas, Hinckley et al. and Akisha does not explicitly teach correcting for keystone distortion.

Riconda et al. similarly teach of a camera system for capturing and displaying images(see paragraphs 0062-0072, 0075).

However, in addition to the combined teachings of Thomas, Hinckley et al. and Akisha, Riconda et al. teaches using coordinate information to correct for keystone distortions that result when the image sensor is located off of the perpendicular axis with respect to the plane of the image being sensed(paragraphs 0092-0103, figures 12A-12E, especially paragraph 0094).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the coordinate information taught by the combination of Thomas, Hinckley et al. and Akisha to correct for keystone distortion as taught by Riconda et al. for the benefit of improving perceived image quality.

Consider claim 11, and as applied to claim 2 above, Thomas teaches that the sensor provides two-dimensional information(column 4, lines 42-59).

Hinckley et al. teach that the orientation sensors produce three dimensional orientation information(column 4, line 30 through column 5, line 3), and that said orientation information is used to correct perspective distortions of the image being viewed(column 9, line 34 through column 10, line 36).

However, the combination of Thomas and Hinckley et al. does not explicitly teach using the three dimensional orientation information to correct for keystone, barrel and other distortions that result when the image sensor is located off of the perpendicular axis with respect to the plane of the image being sensed.

Ahisha is similar to Thomas in that Ahisha teaches of a camera containing an image sensor(30) and an image processor(40, figure 1).

However, in addition to the combined teachings of Thomas and Hinckley et al., Akisha teaches using coordinate information to correct for barrel and other(i.e. pincushion) distortions(see figure 2) that result when the image sensor is located off of the perpendicular axis with respect to the plane of the image being sensed(See paragraphs 0021-0029, especially paragraphs 0024, and 0026-0029).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the coordinate information taught by the combination of Thomas and Hinckley et al. to correct for barrel and pincushion distortion as taught by Akisha for the benefit of improving perceived image quality.

The combination of Thomas, Hinckley et al. and Akisha does not explicitly teach correcting for keystone distortion.

Riconda et al. similarly teach of a camera system for capturing and displaying images(see paragraphs 0062-0072, 0075).

However, in addition to the combined teachings of Thomas, Hinckley et al. and Akisha, Riconda et al. teaches using coordinate information to correct for keystone distortions that result when the image sensor is located off of the perpendicular axis with respect to the plane of the image being sensed(paragraphs 0092-0103, figures 12A-12E, especially paragraph 0094).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the coordinate information taught by the combination of Thomas, Hinckley et al. and Akisha to correct for keystone distortion as taught by Riconda et al. for the benefit of improving perceived image quality.

Consider claim 12, and as applied to claim 7 above, Thomas teaches that the sensor provides two-dimensional information(column 4, lines 42-59).

Hinckley et al. teach that the orientation sensors produce three dimensional orientation information(column 4, line 30 through column 5, line 3), and that said orientation information is used to correct perspective distortions of the image being viewed(column 9, line 34 through column 10, line 36). It would have been obvious to a person having ordinary skill in the art at the time of the invention to replace the two-dimensional orientation sensor taught by Thomas with the three-dimensional orientation sensor taught by Hinckley et al. for the benefit of obtaining more precise and detailed image orientation information.

However, the combination of Thomas and Hinckley et al. does not explicitly teach using the three dimensional orientation information to correct for keystone, barrel and other distortions that result when the image sensor is located off of the perpendicular axis with respect to the plane of the image being sensed.

Ahisha is similar to Thomas in that Ahisha teaches of a camera containing an image sensor(30) and an image processor(40, figure 1).

However, in addition to the combined teachings of Thomas and Hinckley et al., Akisha teaches using coordinate information to correct for barrel and other(i.e. pincushion) distortions(see figure 2) that result when the image sensor is located off of the perpendicular axis with respect to the plane of the image being sensed(See paragraphs 0021-0029, especially paragraphs 0024, and 0026-0029).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the coordinate information taught by the combination of Thomas and Hinckley et al. to correct for barrel and pincushion distortion as taught by Akisha for the benefit of improving perceived image quality.

The combination of Thomas, Hinckley et al. and Akisha does not explicitly teach correcting for keystone distortion.

Riconda et al. similarly teach of a camera system for capturing and displaying images(see paragraphs 0062-0072, 0075).

However, in addition to the combined teachings of Thomas, Hinckley et al. and Akisha, Riconda et al. teaches using coordinate information to correct for keystone distortions that result when the image sensor is located off of the perpendicular axis with

respect to the plane of the image being sensed(paragraphs 0092-0103, figures 12A-12E, especially paragraph 0094).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the coordinate information taught by the combination of Thomas, Hinckley et al. and Akisha to correct for keystone distortion as taught by Riconda et al. for the benefit of improving perceived image quality.

11. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hinckley et al. in view of Thomas as applied to claim 17 above, and further in view of Harrison(US 6,597,384).

Consider claim 18, and as applied to claim 17 above, Hinckley et al. teach of using touch sensors, but do not explicitly teach manually entering orientation information. Thomas does not explicitly teach detecting the orientation of a display.

Harrison is similar Hinckley et al. in that Harrison teaches a mobile device(figures 1a and 1b) with a display and touch sensors(100, 102, 104, 106).

However, in addition to the teachings of Thomas and Hinckley et al., Harrison teaches that the touch sensors are used to manually enter the display orientation(figure 3).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to manually enter display orientation information as taught by Harrison in the digital camera taught by the combination of Thomas and Hinckley et al.

for the benefit that the user can obtain the correct image orientation when the displayed image orientation is incorrect(Harrison, column 2, lines 38-39).

12. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hinckley et al.(US 7,289,102) in view of Thomas(US 6,781,623) as applied to claim 17 above, and further in view of Ahisha(US 2005/0007477) and Riconda et al.(US 2002/013093).

Consider claim 21, and as applied to claim 17 above, Hinckley et al. teach that the orientation sensor of the display produces three dimensional orientation information(column 4, line 30 through column 5, line 3), and that said orientation information is used to correct perspective distortions of the image being viewed(column 9, line 34 through column 10, line 36).

However, the combination of Thomas and Hinckley et al. does not explicitly teach using the three dimensional orientation information to correct for keystone, barrel and other distortions that result when the image sensor is located off of the perpendicular axis with respect to the plane of the image being sensed.

Ahisha is similar to Thomas in that Ahisha teaches of a camera containing an image sensor(30) and an image processor(40, figure 1).

However, in addition to the combined teachings of Thomas and Hinckley et al., Akisha teaches using coordinate information to correct for barrel and other(i.e. pincushion) distortions(see figure 2) that result when the image sensor is located off of

the perpendicular axis with respect to the plane of the image being sensed(See paragraphs 0021-0029, especially paragraphs 0024, and 0026-0029).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the coordinate information taught by the combination of Thomas and Hinckley et al. to correct for barrel and pincushion distortion as taught by Akisha for the benefit of improving perceived image quality.

The combination of Thomas, Hinckley et al. and Akisha does not explicitly teach correcting for keystone distortion.

Riconda et al. similarly teach of a camera system for capturing and displaying images(see paragraphs 0062-0072, 0075).

However, in addition to the combined teachings of Thomas, Hinckley et al. and Akisha, Riconda et al. teaches using coordinate information to correct for keystone distortions that result when the image sensor is located off of the perpendicular axis with respect to the plane of the image being sensed(paragraphs 0092-0103, figures 12A-12E, especially paragraph 0094).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the coordinate information taught by the combination of Thomas, Hinckley et al. and Akisha to correct for keystone distortion as taught by Riconda et al. for the benefit of improving perceived image quality.

Conclusion

13. Any objections made by the Examiner to the claims and specification are hereby removed in view of Applicant's response.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

15. Nickel et al.(US 2004/0141085) teach of reconfiguring a display based on a detected device orientation(figure 1), and displaying an image based upon received image sensor orientation information(figure 8).

16. Hsu(US 6,819,362) teaches of detecting an image sensor orientation and converting a displayed image based upon said orientation(see abstract, figures 1-4).

17. Oya et al.(US 2003/0052985) teach of detecting the orientation of a camera using a gravity sensor(see abstract, figures 2-7 and 13-19).

18. Suzuki(US 7,019,779) teaches of changing a display orientation in response to a user input(figures 5 and 6a, column 7, line 19 through column 8, line 11).

19. Barrus et al.(US 7,002,604) teach of changing a display orientation in response to a user input(see abstract, figures 7-9).

20. Isoyama(US 7,286,178) teaches of displaying an image based upon an output of an image sensor orientation sensor(see abstract).

21. Kitaguchi et al.(US 6,686,954) teach of using a two-dimensional gyro to correct image orientation(column 12, lines 26-42).

22. Mochizuki(US 2003/0142116) teaches of correcting for distortions in a display device(see abstract).

23. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALBERT H. CUTLER whose telephone number is (571)270-1460. The examiner can normally be reached on Mon-Thu (9:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (571)-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC

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